

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the

➤ “Crank” and “opening” claimed in claim 5,
must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: The specification should not directly reference claims, because the claims can change during the examination process. This mistake starts in paragraph 1. The specification should include headings for the appropriate sections as described in CFR 37 § 1.77. Appropriate correction is required.

Claim Objections

2. Claim 2-5 are objected to because of the following informalities: In claim 2, the applicant recites "...the balls on that side..." This language is confusing. Examiner recommends changing "that side" to "one side". The remaining claims are objected to since they depend upon claim 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4-6, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 4 and 5,

The term "the shaft member" lacks antecedent basis and it's unclear component the applicant is referring to. Is this an additional member or is it the spindle?

Regarding claim 6,

It appears a portion of the claim is missing and the claim is rendered indefinite since it no longer makes any sense.

Regarding claim 7,

The term "the activation element" lacks antecedent basis as it is not claimed in claim 1 and thus it's unclear which component of claim 1 qualifies as the activation element.

Regarding claim 10,

In addition to the problem with claim 7 that carries to this claim, the term "safety clutch" lacks antecedent basis and it is unclear if the applicant is referring to a completely different clutch.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Whittingham (US patent 4635904).

The reference numerals and other statements within the parenthesis below correspond to the prior art.

Regarding claim 1,

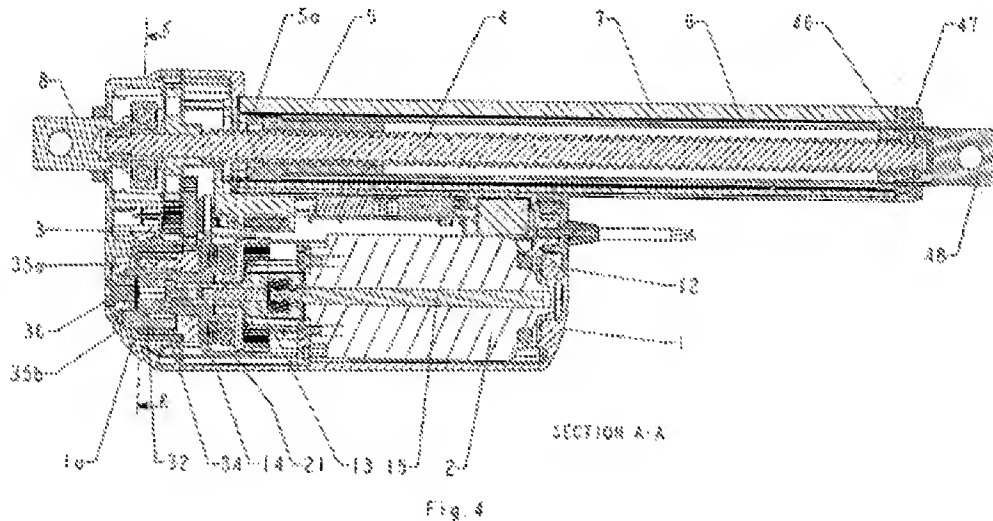
Applicant claims a linear actuator (fig. 1,10; Examiner notes prior art is a jack which has the same structure as the claimed actuator and functions as a linear actuator) comprising:

- A cabinet (fig.1, 22 or 24) having
- A reversible electric motor (fig. 2, 60 and col.6, lines 24-25; Examiner notes an electric motor is clearly capable of being reversible by switching the current) with a motor shaft (fig.2, 62),
- A reduction gear (fig.2, 64,66,76), where a first stage (fig.2, 64) is connected with the motor shaft as seen in fig.2,
- A spindle (fig.2, 88) whose one end is connected with an output side on the last stage of in the reduction gear (fig.2, 76) and the other end indicates the front of the actuator,
- A spindle nut (fig.2, 114; Examiner notes, prior art calls this a ball follower since its a ball screw) secured against rotation and translates linearly along the spindle (col.6, lines 13-15),
- A rear mount (fig.1, 14 and 20)
- An overload clutch (fig.2, 82, and col.6, lines 56-58) wherein the overload clutch is connected to one of the first stages in the reduction gear (fig.2; connected to gears 76,66,64).

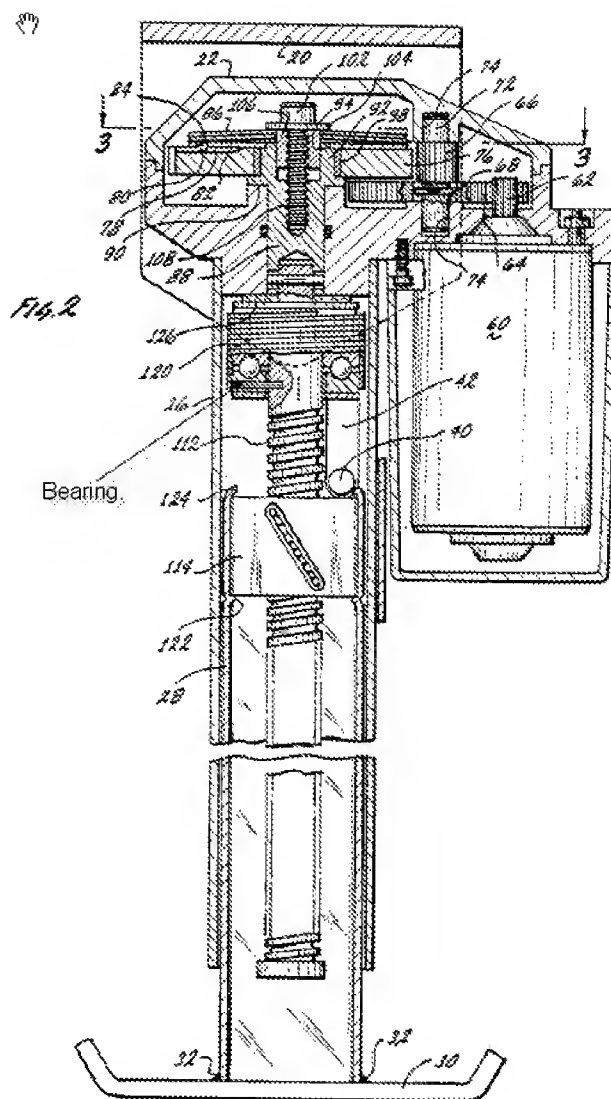
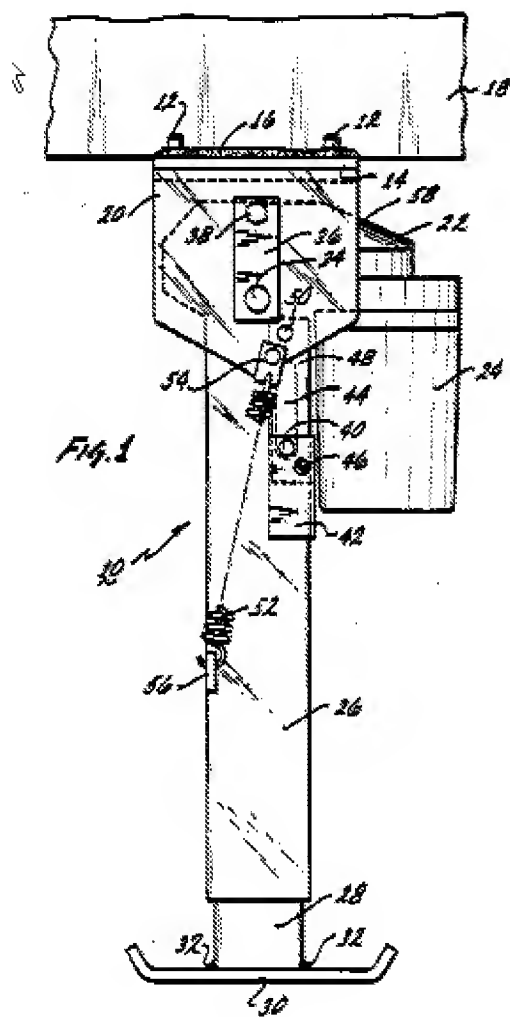
Art Unit: 4171

Regarding claim 6, as best understood,

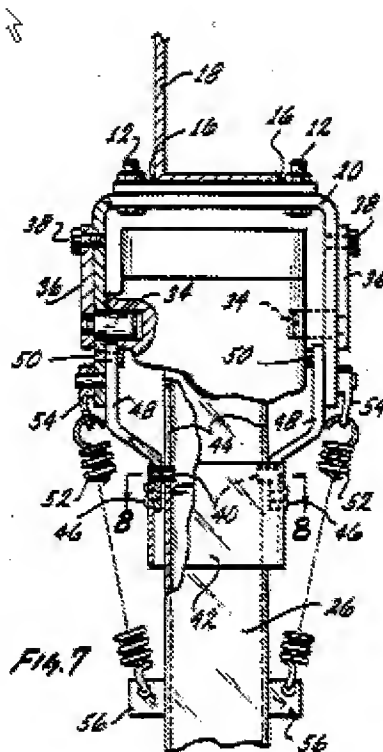
Applicant claims that the rear mount and a bearing (fig. 2, labeled by examiner) are secured in a mounting element (fig.1, 20) consisting of two parts (fig.7, 36) which are mounted in a depression in the cabinet (fig.7, shows how element 36 is mounted through pins 34 into the depressions in the cabinet) and secured with a nut (fig.7, 12) screwed on to the part of the rear mount that protrudes through the cabinet (fig.7, element 20 is part of mount that protrudes the cabinet as described above).



Above figure- Applicants actuator.



Art Unit: 4171



Above figures- Whittingham's invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

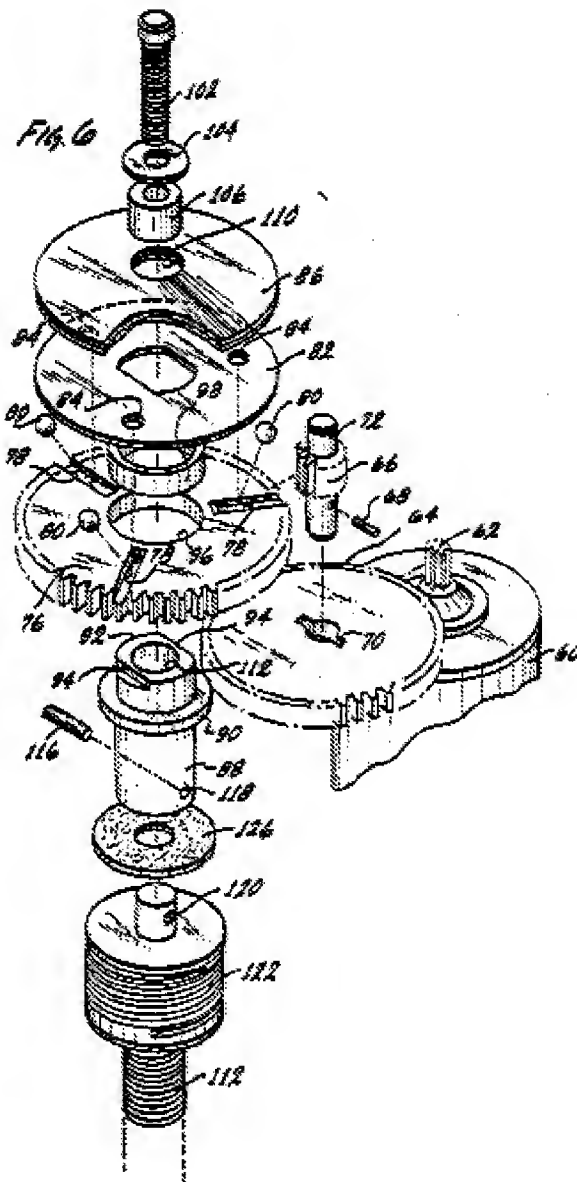
6. Claims 2-4, 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whittingham (US patent 4635904) in view of Alfano et al. (US patent 6259175).

Whittingham teaches the following applicant claimed structure:

Regarding claim 2,

Applicant claims the overload clutch is a ball and ratchet clutch (fig.2; Examiner notes the prior art doesn't call their clutch by the same name but it has the same structure and therefore is the same type of clutch) comprising:

- a ring with holes (fig.6, 82)
- a first plate (fig.6, 76) with depressions (fig.6, 78) that engage the balls (fig.6, 80) and is firmly connected to the transmission from the motor (fig.2, the gear 76 is connected to the transmission of the motor),
- a second plate with depressions that engage another side of the balls which Whittingham fails to disclose,
- a spring mounted against the ceiling in a cap (fig.2, spring 86 mounted against the ceiling of a cap 94. Examiner takes the position that washer 94 acts as a cap on the spring because it covers it.),
- wherein the cap is secured indirectly to the first plate member (seen in fig.2, the cap is secured to the first plate member through bolt 102), and
- wherein the ring with the balls is connected with the further transmission to the spindle (fig.2, gear 76 being part of the transmission and the spindle is disposed through the ring.)



Above figure- Whittingham's invention.

Regarding claim 3,

Applicant claims the ring with the balls being connected to a shaft member (fig.2, 88) with a gear wheel (fig.2, 76) as a transition to subsequent stages in the gearing in

the spindle (fig.2, gear wheel 76 is connected to the rest of the reduction gearing and transmits power to the spindle 112).

Regarding claim 4,

Applicant claims a shaft member being connected with a brake device. Examiner takes the position that the spindle described above is a shaft member and it is connected with a brake assembly or device (fig.2, 122).

Regarding claim 7,

Applicant claims a guide profile (fig.2, 26) is attached to end of the cabinet and is also attached to the cabinet with two claws (fig.7, 34, 40, the pins 34 and 40 act as claws to attach the guide profile to the cabinet) which grip the outside of the guide profile.

Regarding claim 8,

Applicant claims an electrical control for the actuator incorporated inside the cabinet which Whittingham fails to teach.

It is clear that Whittingham fails to teach a second plate member in the clutch system and fails to teach an electric control for the actuator.

Alfano et al. teaches the following regarding applicants claims:

Regarding claim 2,

Alfano et al. teaches a linear actuator having a similar clutch system (fig.9) to the applicant's claimed invention for the purpose of limiting the amount of torque that can be transmitted from the motor to the screw assembly (see abstract) comprising:

- a ring with holes (fig.9, 83, The gear has hole for the balls and the clutch plates.)
- a first plate (fig.9, 85) with depressions (fig.9, 85a) that engage the balls (fig.9, 87) and is firmly connected to the transmission from the motor (fig.9, the gear 83 is connected to the transmission of the motor),
- a second plate with depressions that engage another side of the balls (fig.9, 86 and 86a),
- a spring mounted against the ceiling in a cap (fig.9, springs 90-92 mounted against the ceiling of a cap 94. Examiner takes the position that retaining ring 94 acts as a cap on the spring because it covers it.),
- wherein the cap is secured indirectly to the first plate member (seen in fig.9, the cap is secured to the first plate member the other members of the clutch assembly), and
- wherein the ring with the balls is connected with the further transmission to the spindle (fig.9, gear 83 being part of the transmission and a spindle (fig.9, 81) is connected to the gear 83.)

Regarding claim 8,

Alfano et al. teaches that printed circuits are included within the housing for the actuator for the purpose of electrical devices such as limit switches used to generate electric signals when the actuator has extended or retracted a certain amount (col.7, lines 26-36).

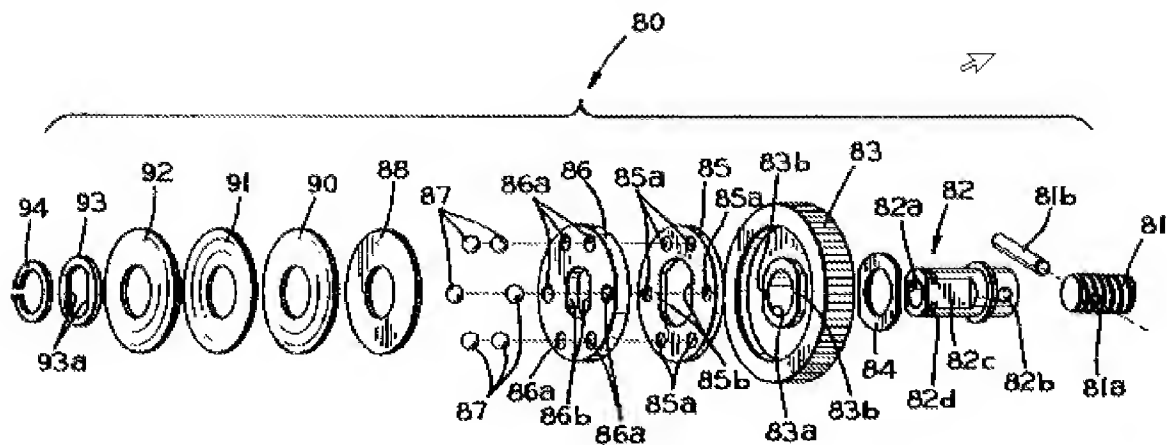


FIG. 9
(PRIOR ART)

Above figure- Alfano et al.'s clutch system.

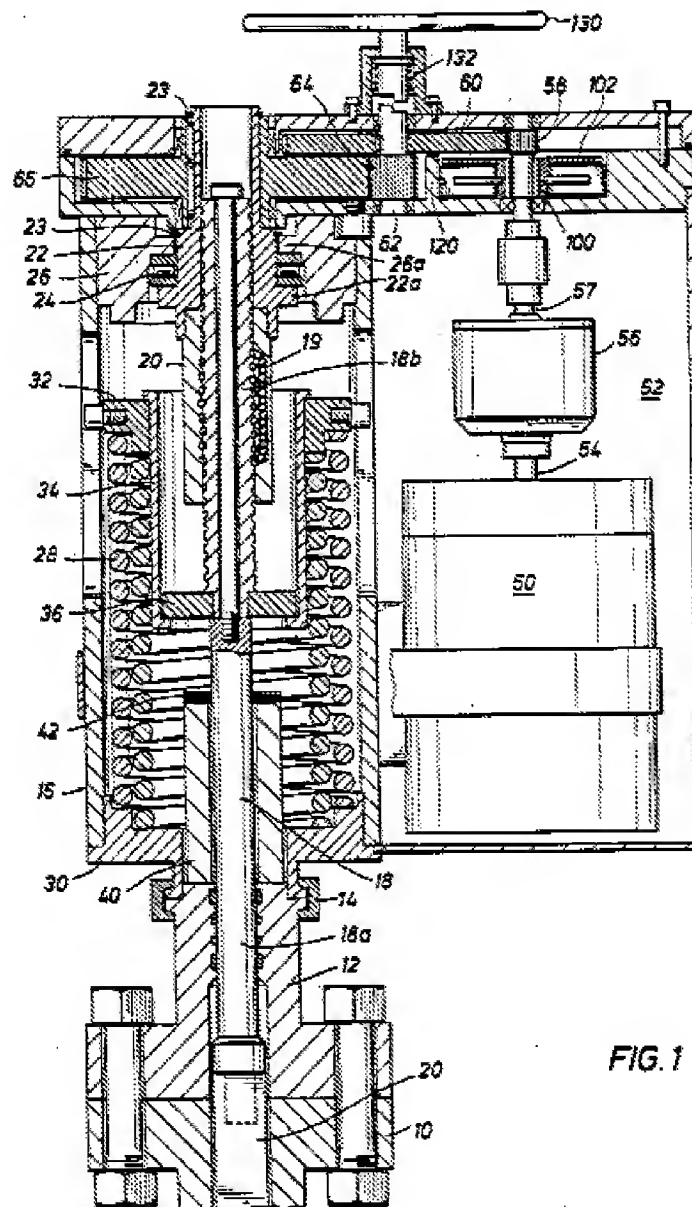
Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the clutch assembly taught by Alfano et al. and the printed circuits taught by Alfano et al. with the teachings of Whittingham for the purpose of providing better torque limiting capabilities and further control the extent of movement of the actuator electronically.

7. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whittingham (US patent 4635904) in view of Akkerman (US patent 5195721).

Applicant claims that the end of a shaft member or an extension thereof is configured to receive a crank through an opening in the cabinet for manual operation of the actuator.

Whittingham fails to teach an actuator configured to be manually operated with a crank.

Akkerman teaches a valve actuator configured with an opening in the housing for a crank (fig.1, 130) in order to provide a way to manually operate the actuator in case the electric motor fails (col. 5, lines 66+, col. 6 lines 1-2).



Above figure- Akkerman's actuator.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the manual operation mechanism taught by Akkerman with the actuator taught by Whittingham in order to provide a back-up mechanism for operating the actuator in case of motor failure.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whittingham (US patent 4635904) in view of Abraham (US patent 4712441).

Applicant claims two electrical switches for controlling the end stop positions of the spindle nut, which are activated by a longitudinally movable element with two arms seated in a slot in a housing, said arms having a spring interposed between them whose ends engage a stop in the housing.

Whittingham fails to disclose the switches along with the structure connecting them.

Abraham discloses a linear actuator with a limit switch assembly that has two electrical switches (fig.8 and fig. 9, 210 and 212) which are operated by the shaft (fig.9, 54) which is connected to two arms (fig. 8, 166 and 208, Examiner takes the position that the cams can be considered arms because they can move and they operate the limit switches (col.7, lines 66+ and col.8, line 1)). These arms are seated in a housing (fig.8, 36) and have a spring (fig. 5, 158) interposed between them whose ends engage a stop or push button (fig.5 and fig. 8, 150) which disengages the drive gear if depressed (col. 7, lines 40-44). The limit switch assembly which contains these components is used for controlling the power input to the drive motor (col. 8, lines 1-4).



Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine switches or limit switch assembly taught by Abraham with

the linear actuator taught by Whittingham in order to provide a linear actuator with better power control and therefore better position control.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whittingham (US patent 4635904) in view of Alfano et al. (US patent 6259175) as applied in the claims 1 and 7 above, and further in view of Abraham (US patent 4712441).

Applicant claims a potentiometer constructed as an add-on unit in engagement with down gearing between a clutch and the spindle.

The combination of Whittingham and Alfano et al. fail to teach this potentiometer.

Abraham teaches the use of a potentiometer (fig. 5, 190) for the purpose indicating the position of the drive nut (col.8, lines 39-43). The potentiometer is connected to the reduction gearing (fig. 5, 198).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the potentiometer taught by Abraham with the combination of Whittingham and Alfano et al. in order to provide an electrical signal with the drive nut position to the circuits or control devices being used in controlling the position of the actuator. Furthermore, it would be obvious to provide this potentiometer between a clutch and a spindle since it is connected to the reduction gearing which is already disposed between these components.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art relates to similar actuators and torque limiting devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Diaz whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Thursday 7:30am-6:00pm, Friday's off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 4171

Thomas Diaz
Examiner
Art Unit 4171

